

Table A1. Carbon atom mappings of the reactions of the studied metabolic model. Reactions with a forward arrow were modeled as being unidirectional, whereas those with a two way arrow were modeled as reversible. Abbreviations: GLC: glucose, G6P: glucose-6-phosphate, F6P: fructose-6-phosphate, G3P: glyceraldehyde-3-phosphate, PYR: pyruvate, P5P: xylulose-5-phosphate/ribose-5-phosphate/ribulose-5-phosphate, E4P: erythrose-4-phosphate, S7P: sedoheptulose-7-phosphate, OAA: oxaloacetate, MAL: malate, FUM: fumarate, SUC: succinate, ACCOA: acetyl-coA, GLY: glycerol, mit: mitochondrial, cyt: cytosolic.

Reactions	
Glycolysis	Pentose Phosphate Pathway
GLC (abcdef) → G6P (abcdef)	G6P (abcdef) → CO2 (a) + P5P (bcdef)
G6P (abcdef) ⇌ F6P (abcdef)	P5P (abcde) ⇌ C2 (ab) + G3P (cde)
F6P (abcdef) → G3P (cba) + G3P (def)	F6P (abcdef) ⇌ C2 (ab) + E4P (cdef)
G3P (abc) → PYR _{cyt} (abc)	S7P (abcdefg) ⇌ C2 (ab) + P5P (cdefg)
Uncategorized cytosolic reactions	F6P (abcdef) ⇌ C3 (abc) + G3P (def)
PYR _{cyt} (abc) + CO2 (d) → OAA _{cyt} (abcd)	S7P (abcdefg) ⇌ C3 (abc) + E4P (defg)
OAA _{cyt} (abcd) ⇌ MAL _{cyt} (abcd)	Intracellular transport reactions
MAL _{cyt} (abcd) ⇌ FUM _{cyt} (abcd)	PYR _{cyt} (abc) ⇌ PYR _{mit} (abc)
FUM _{cyt} (abcd) → ½ FUM _{cyt} (abcd) + ½ FUM _{cyt} (dcba)	OAA _{cyt} (abcd) ⇌ OAA _{mit} (abcd)
FUM _{cyt} (abcd) ⇌ SUC _{cyt} (abcd)	MAL _{cyt} (abcd) ⇌ MAL _{mit} (abcd)
SUC _{cyt} (abcd) → ½ SUC _{cyt} (abcd) + ½ SUC _{cyt} (dcba)	FUM _{cyt} (abcd) ⇌ FUM _{mit} (abcd)
G3P (abc) → ½ GLY (abc) + ½ GLY (cba)	SUC _{cyt} (abcd) ⇌ SUC _{mit} (abcd)
Mitochondrial	Biomass formation related reactions
PYR _{mit} (abc) → CO2 (a) + ACCOA _{mit} (bc)	ACCOA _{mit} → biomass
ACCOA _{mit} (ab) + OAA _{mit} (cdef) → SUC _{mit} (abde) + 2 CO2 (c, f)	PYR _{mit} → biomass
SUC _{mit} (abcd) → ½ SUC _{mit} (abcd) + ½ SUC _{mit} (dcba)	ACCOA _{mit} (ab) + OAA _{mit} (cdef) → CO2 (c)
FUM _{mit} (abcd) → ½ FUM _{mit} (abcd) + ½ FUM _{mit} (dcba)	Plasma membrane transport reactions
SUC _{mit} (abcd) ⇌ FUM _{mit} (abcd)	PYR _{cyt} → PYRextracellular
FUM _{mit} (abcd) ⇌ MAL _{mit} (abcd)	OAA _{cyt} → OAAextracellular
MAL _{mit} (abcd) ⇌ OAA _{mit} (abcd)	SUC _{cyt} → SUCextracellular
MAL _{mit} (abcd) → PYR _{mit} (abc) + CO2 (d)	FUM _{cyt} → FUMextracellular
	MAL _{cyt} → MAlextracellular
	GLY _{cyt} → GLYextracellular
	CO2 _{intracellular} (a) ⇌ CO2 _{extracellular} (a)